



Building 911C  
P.O. Box 5000  
Upton, NY 11973-5000  
Phone 631 344-4531  
Fax 631 344-5954  
hershcovitch@bnl.gov

## Memo

*DATE:* April 9, 2004

*TO:* RHIC E-Coolers

*FROM:* *Ady Herscovitch*

*SUBJECT:* **Minutes of the April 9, 2004 Meeting**

Present: Ilan Ben-Zvi, Andrew Burrill, Alexei Fedotov, Michael Harrison, Ady Herscovitch, Animesh Jain, Dmitry Kayran, Vladimir Litvinenko, Thomas Ludlam, William Mackay, Stephen Peggs, Thomas Roser, Dejan Trbojevic, Jie Wei, Jiawen Xia (Lanzhou China).

Topics discussed: NSAC, Superconducting Solenoid.

**NSAC:** Tom Ludlam opened the meeting by reporting that BNL drafted a 20 year plan for RHIC. The plan was sent to the DOE, which in turn asked the Nuclear Science Advisory Committee (NSAC) to form a subpanel for RHIC that will evaluate, among others, RHIC II, EBIS, upgrades, detectors, as well as US involvement in the heavy ion program on LHC and other European machines. The subpanel is scheduled to meet at BNL June 2<sup>nd</sup> – 5<sup>th</sup>, 2004. Documentations, which include R&D for electron beam cooling, are needed by May 1<sup>st</sup>. Thomas Roser said that he'll prepare time-scale documentation for RHIC II; he also pointed out that in 10 days, there will be a RHIC meeting at Yale, where he'll give a talk on RHIC II.

**Superconducting Solenoid:** in last week's meeting, it was concluded that too many magnet options were plausible and that most viable options were to be discussed at this meeting. Ideally, as Ilan commented, one long solenoid is preferable. However, there are fabrication difficulties in meeting all needed parameters in a 30 meter long superconducting solenoid. Alexei presented a comparison the cooling force for four solenoid options:

1. Original design: one solenoid L=30 meters, B=1T, relative cooling 1.5
2. 2 solenoids - 15 meters each: field in opposite direction, B=1T, relative cooling 1.01
3. 2 solenoids - 13 meters: field in opposite direction, B=1T, relative cooling 0.8
4. 2 solenoids - 13 meters: field in the same direction, B=1T, relative cooling 1.21

It is clear that when the magnetic fields are in opposite direction the each solenoid acts independently, and there is a significant loss in cooling. E.g., between option 1 and 3 a factor of 1.9 in cooling is lost, while not much loss occurs when the magnetic field is in the same direction. A discussion ensued about the merit of going to 2T and even 4T magnetic fields. For that the whole system must be simulated for the higher fields. As Ilan pointed out, higher fields can result in higher emittance due to coupling in of magnetized emittance.